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AUTHOR Smith, Charles W.
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ABSTRACT

This paper discusses questioning patterns that can be used by teachers to facilitate cognitive development in reading instruction. The questioning patterns suggested are intended to include the kinds of questions used on worksheets, tests, and in class projects. The opinions of various authors who stress the importance of teacher questioning patterns are reviewed. Among these authorities are Harris and Smith, who emphasize the importance of teacher questioning in developing critical thinking; Guszak, who indicates that teachers overemphasize recall thinking; and Taba, who indicates that teachers give little thought to the classroom questions they ask and the sequencing of such questions in instruction. A brief description of each of the six levels of thinking in the cognitive domain are listed--knowledge, comprehension, application, analysis, synthesis, and evaluation. Also included is a reading passage with sample questions and representative answers. (WR)

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Questioning behavior that facilitates cognitive development in reading

CHARLES W. SMITH

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Are you aware of the cognitive levels of thinking that you use? Are you aware of the emphasis that each level receives in your teaching? These are crucial considerations for an effective reading program, according to Charles W. Smith, associate professor of elementary education at Northern Illinois University in DeKalb.

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Reading furnishes the mind only with the materials of knowledge; it is thinking that makes what is read ours. We are of the ruminating kind, and it is not enough to cram ourselves with a great load of collections; unless we chew them over again, they will not give us strength and nourishment.

--John Locke

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Thinking ability is often said to be a sought-after goal of education. Thinking skills do not develop automatically. The teacher can ask questions that encourage thinking at various levels. Questioning patterns as referred to here are not confined to oral questions that teachers might ask but are intended to include the kinds of questions used on worksheets and tests, the kinds of questions proposed for class projects, and the types of questions asked by students as well.

Flanders (1965, p. 1) indicated that approximately 60% of class time is utilized by pupil-teacher talk. Teachers, he asserts, do about 70% of this talking. Part of this time the teacher is asking questions. Students learn to think in response to the types of questions asked of them. The teacher who asks questions predominantly at the rote knowledge level of thinking probably does little to enhance the thinking skills of his students. In like manner, the teacher who asks questions at various levels of cognitive thinking is likely to encourage within his students a greater variety of diversified thinking.

It is estimated (Hunkins, 1972, p. 3) that it initially took approximately two thousand years for man's knowledge to double. Currently, knowledge is doubling with each ten-year span of time. Though stress on facts may at times be important, teachers need to give increased attention to stressing concepts (how facts are related) and

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generalizations (how concepts are related).

Teachers need to be aware of the levels of cognitive thinking and the types of questions they ask as well as the levels of thinking encouraged by their questions. Attention should also be given to the emphasis that each level of questioning receives in their teaching. In this way, teachers are better able to plan learning experiences that give students opportunities to develop various levels of thinking. Hunkins asserted that almost any concept can be taught in several ways, each of which will likely lead to different levels of thinking. (Hunkins, 1972, p. 160)

Various authorities have stressed the importance of teacher questioning patterns. Harris and Smith (1972) emphasized the importance of teacher questioning in developing critical thinking. They emphasized literal recall, interpretation (analysis and inference), and critical judgment or evaluation.

A Reading Comprehension Question Response Inventory developed by Guszak (1967, p. 229) assessed the teacher's use of six types of questions: recognition, recall, translation, conjecture, explanation, and evaluation. Conclusions reached by Guszak (1967, p. 116) indicated that teachers emphasized recall thinking and somewhat avoided opportunities to extend thinking.

Taba , 1967, (p. 123) indicated that teachers rarely gave careful thought to classroom questions they asked and the sequencing of

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such questions in the instructional process. Taba (1967, pp. 119-122) viewed the function of questions as focusing, extending thought at the same level, and raising thought to a higher level.

Bloom (1956) stressed six levels of thinking as comprising the cognitive domain: knowledge, comprehension, application, analysis, synthesis, and evaluation.

The consensus of the above authors indicates that questioning is a vital part of classroom teaching if learners are to become thinking individuals. Though the various authorities have categorized types of questioning differently, they all stressed the use of a diverse array of questioning types.

Teachers have often been criticized for an overemphasis of questions stressing rote recall (knowledge). If students are to learn to function as rational, thinking individuals, it is important that teachers use some systematic way of helping students to achieve this goal. Bloom's Taxonomy (1966) will be used as an example of one method that teachers might employ to systematically structure their questioning techniques.

Sanders' book (1966) based upon Bloom's taxonomy should prove helpful as an additional reference to the teacher desirous of developing increased competency in structuring questions at various levels of cognitive thinking. Sanders attempted to aid teachers in structuring questions at the six levels of cognitive thinking using examples from several subject areas. He views all categories above the memory level as evidence of critical thinking.

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It should be emphasized that every question may not be categorically classified as belonging to exclusively one category. Equally important, not all students may arrive at answers to a given question by using the same level of cognitive thinking. Variation may be caused by varying experiential backgrounds that students bring to the learning situation or by the particular classroom context from which the question originates. Teachers must also keep in mind that the use of any specific taxonomical level is in part dependent upon the content of the materials used and the purposes the teacher has in mind. These factors should not deter teachers from seriously considering question type and emphasis.

Since each level of the taxonomical classification is inclusive of those levels lower than itself, statements and questions are classified at the highest level of thinking that they might encourage.

The Teacher's Guide accompanying better basal reading series will likely include questions that are carefully chosen to facilitate varying levels of thinking. Teachers might well analyze the various types of questions used in such guides in every subject area as one criterion when considering purchase. Teachers desiring to operate independently of such a Teacher's Guide must give increased attention to the choice of questions. The idea of stressing varying levels of cognitive thinking must not be construed as applicable only to the reading lesson. Indeed there is applicability to every area of the curriculum.

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Audio or video taping might be used to help one to analyze the types of questions posed by students and teachers alike. Teacher use of questioning patterns at various levels should result in the use of varied types of questions by students.

Brief descriptions of each of the six levels of thinking in the cognitive domain are listed. Reference may be made to Bloom (1956), Sanders (1966), or Hunkins (1972) for a more comprehensive description.

KNOWLEDGE type questions encourage students to recognize or recall information that is clearly included in the text. In responses to questions at this level, the presentation of the material may differ little from the way in which the material was originally presented. Understanding of the materials is not necessarily a prerequisite to recall of it at this level.

COMPREHENSION questions ask the learner to show an understanding of the ideas contained in a communication. They may involve translation (putting information into another form, i.e., pictures to words, words to numbers, paraphrasing), interpretation (explaining and summarizing), or extrapolation (predicting consequences or implications).

APPLICATION of a method, rule, law, theory, or principle requires the learner to use the material in a context differing from the original situation but similar to the one in which it was previously learned. It is hoped that the learner would decide appropriate situations in which to apply his knowledge.

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ANALYSIS is breaking down a communication into its constituent parts so that it may be more easily understood. It may involve analysis of the elements (i.e., separating facts from opinions), analysis of relationships between the parts, or an analysis of the organizational principles involved.

SYNTHESIS involves putting elements together into a unique communication. Synthesis encourages original, creative thinking. It may result in the creation of a speech, story, essay, research proposal, thesis, musical composition, art form, etc.

EVALUATION implies that the learner will make quantitative or qualitative judgments regarding the value of the material for a given purpose though using definite criteria. Judgment may be on the basis of organizational criteria or upon relevance to one's purpose.

After you read the following story, "Androclus and the Lion" (McQueen, 1967), it would be profitable to list several questions that might be appropriately asked at each level of cognitive thinking. Sample questions and representative answers will be included at the conclusion of the article.

ANDROCLUS and the LION[1]

Androclus lived many years ago in Rome, where he was a slave. His owner was cruel to him.

Androclus finally could not stand it any longer. So finally, with the help of some other slaves, he was able to run away to a nearby country.

However, he had to stay away from towns, since he would be recognized as a slave. So he lived in the woods.

[1]Carrousel of Stories, McQueen Basic Readers, Second Level (First Sem.).

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One day he was out hunting for food, when he saw a cave in the side of the mountain.

"Ah, this is better than sleeping out in the the open, where I get wet when it rains."

He started immediately to gather armfuls of dried grass with which to make a bed.

Androclus was kneeling, smoothing out the grass, when a lion walked in the door. The lion had also thought it was a good place to make a home.

Helpless, Androclus waited to see what the lion would do. He felt the lion would have a big meal.

But the lion did not growl or seem angry at all. As he came toward him, Androclus noticed that the great lion was limping.

When he reached Androclus, the lion put out his paw.

The paw was very red and swollen. The great beast was having much pain and seemed to be asking Androclus to help him.

Androclus gathered all his courage together and reached out and took the paw.

There was a huge thorn in it.

Androclus very carefully pulled the thorn from the paw.

The lion lay down curled up at Androclus' side. He and the lion lived in the cave together for a long time and shared

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each other's food.

But one day some hunters saw Androclus and knew that he was a runaway slave. They hurried over and captured him because there was always a reward for returning a runaway slave.

The hunters took Androclus back to Rome where he was put in prison.

The Romans had a great theatre, where there were great fights between men with swords, or the men and wild beasts.

Androclus was to fight a lion. The whole arena was filled with spectators.

The day came and Androclus was put in the huge arena. Then the lion was let in. He came toward Androclus, roaring and growling, but when he got close to Androclus, he crouched to his feet and began to lick his hand.

All the spectators stood up and shouted in wonderment. Such a thing had never happened before.

Androclus was asked to explain how this had happened.

He told them how he had helped the lion and how they lived together for so long in the cave.

The people of Rome then said he should be a free man and that the lion should be his; and so it was.

Androclus was often seen after that walking on the streets of Rome with the lion following along behind him like a dog.

The following questions are examples of ones that might be appropriate at each of the taxonomical levels of the cognitive domain. Comments

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in parentheses indicate anticipated responses or other comments regarding the responses.

KNOWLEDGE

What is the name of the slave in the story? (Androclus)

In what city had Androclus lived as a slave? (Rome)

What materials did Androclus use to make his bed? (dried grass)

COMPREHENSION

What is Androclus doing in the picture? (The reader from which the story was taken pictures Androclus removing a thorn from the lion's paw.)

What is a thorn? (a sharp pointed part from a tree or shrub)

Summarize what happened after Androclus entered the arena. (The lion came in the arena, growled, and licked the hand of Androclus. Androclus and the lion were then set free.)

APPLICATION

What might make you think that Androclus acted bravely? (drawing upon information from a previous story, a zoo trip, or films) (The lion in its natural state is often seen as a wild beast often attacking other living animals.)

Androclus was a runaway slave, but he was not returned to his owner. What kinds of runaway people today do we try to catch and return? (prisoners, runaway children, soldiers)

ANALYSIS

What scenes from the story could we use to draw a mural? (Androclus

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as a slave, Androclus living in the woods, Androclus in the arena)

What characters would be needed to act out this story? (Androclus, lion, slave owner, hunters, spectators)

What lesson about helping others might be taken from this story? (Those who help others are often helped in return.)

SYNTHESIS

Create another ending for the story. (answers will vary)

What other title might you choose for the story? (answers will vary.)

The Romans set Androclus free. What other actions could they have taken instead of freeing him? (They could have made him fight another animal, imprisoned him, made him remain as a slave, ...)

EVALUATION

Do you think Androclus did the right thing by pulling the torn from the lion's paw? Why, or why not? (answers will vary.)

Did Androclus deserve to be freed? Why or why not? (answers will vary.)

What part of the story did you enjoy most? Why? (answers will vary.)

Increased attention to an awareness of one's questioning techniques can do much to improve students' ability to think critically. The question can be a very potent tool of the classroom teacher. Don't fail to permit it to add to your instructional effectiveness!

Summary

This author suggests that teaching professionals (1) become aware

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of the various levels of questioning, (2) give thought to the kinds of thinking they wish to develop in students, (3) analyze their own questioning techniques through audio or video taping for type and emphasis of questioning, and (4) ascertain in which situation or with which lessons various levels might be most effectively utilized.

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